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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/796,640	03/09/2004	Daniel J. C. Herr	5347-204CT	2214
20792	7590	04/07/2005	EXAMINER	
MYERS BIGEL SIBLEY & SAJOVEC PO BOX 37428 RALEIGH, NC 27627			ANGEBRANNDT, MARTIN J	
			ART UNIT	PAPER NUMBER
			1756	
DATE MAILED: 04/07/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/796,640

Applicant(s)

HERR ET AL.

Examiner

Martin J. Angebrannndt

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 2/8/2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-22, 24-43 and 46-65 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 5-7, 9-13, 16-19, 24, 27-29, 33-38, 40, 45, 48-50, 54, 55, 58-60 and 62 is/are rejected.
- 7) ☒ Claim(s) 3, 4, 8, 14, 15, 20-22, 25, 26, 30-32, 39, 41-43, 46, 47, 51-53, 56, 57, 61, 63 and 64 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

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1. The response of the applicant has been read and given careful consideration. Responses to the arguments of the applicant are provided after the first rejection to which they are directed. Rejections of the previous office action not appearing below are withdrawn based upon the amendments to the claims, arguments or the proper terminal disclaimer filed 2/8/2005.

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3 Claims 1,2,5-7,9-13,16,17,19,24,27-29,33,34,37,38,40,45,48-50,54-55,58-60 and 62 are rejected under 35 U.S.C. 103(a) as being unpatentable over Joy et al., "Advanced SEM Imaging", in Characterization and Metrology for ULSI Technology", 1998 international Conference, (03/1998), AIP conference proceedings 449, pages 653-666, in view of Spence et al., "Low Energy Point Reflection Electron Microscopy", Surface Review and Letters, Vol. 4(3), pp. 577-587 (1997).

Joy et al., "Advanced SEM Imaging", in Characterization and Metrology for ULSI Technology", 1998 international Conference, (03/1998), AIP conference proceedings 449, pages 653-666 teaches forward scattering holography with respect to figure 8 and the text on page 659. The particular detectors used are not disclosed.

Spence et al., "Low Energy Point Reflection Electron Microscopy", Surface Review and Letters, Vol. 4(3), pp. 577-587 (1997) describes the use of a field emitter tip placed adjacent to a stepped surface with respect to figure 7 and describes the resulting Fresnel diffraction image

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emerging from this. The measurements are done using microchannel plates (MCP) as shown in figures 1 and 3.

It would have been obvious to one skilled in the art to modify the process of Joy et al., "Advanced SEM Imaging", in Characterization and Metrology for ULSI Technology", 1998 international Conference, (03/1998), AIP conference proceedings 449, pages 653-666 by using a microchannel plate detection means such as that taught by Spence et al., "Low Energy Point Reflection Electron Microscopy", Surface Review and Letters, Vol. 4(3), pp. 577-587 (1997) with a reasonable expectation of capturing/resolving the desired diffraction image based upon the similarity of layout for the electron emitter tip and the scattering/reflection surface and the disclosure of measuring diffraction patterns in Spence et al., "Low Energy Point Reflection Electron Microscopy", Surface Review and Letters, Vol. 4(3), pp. 577-587 (1997).

The applicant argues as if the use of image detectors, such as microchannel plate detectors, was not embraced by the claims. The examiner points out the instant specification [0026 in the prepub] which specifically describes the use of CCD detectors which generate digital images and specifically describes the use of other detectors. The specification also points out that "Alternately or in addition, the controller can be used the amplitude and phase information to make measurements of particular features of the sample surface" [0027]. This clearly indicates that the embrace measurements of the topography of reflector surfaces. When reading Joy et al. one skilled in the art would note that no detectors are disclosed and would look to other electron imaging processes which record diffraction (holograms are inherently diffractive) patterns, such as Spence et al., who clearly form and record Fresnel diffraction images, for detectors which would be useful in these processes when making and using the

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apparatus of Joy et al. to ensure a reasonable expectation of success. The applicant's pointing to the image analysis ignores the fact that this is specifically described in the instant specification as well as the specific discussion of the use of a "holographic microscope" in the instant specification [0031 in prepub]. The rejection stands.

**The instant specification seems to have a basis for --patterning the reflector surface --- in sections [0047-0048] of the prepub and the examiner suggests inserting this into the method claims to render them patentable. Similarly, the applicant may include a recitation of - - means for patterning the reflector surface- - in the system claims.**

4        Claims 1,2,5-7,9-13,16-19,24,27-29,33,34-37,38,40,45,48-50,54,55,58-60 and 62 are rejected under 35 U.S.C. 103(a) as being unpatentable over Joy et al., "Advanced SEM Imaging", in Characterization and Metrology for ULSI Technology", 1998 international Conference, (03/1998), AIP conference proceedings 449, pages 653-666, in view of Elliott, "Integrated Circuit Manufacturing Technology", pp. 76-81 (1982).

Elliott, "Integrated Circuit Manufacturing Technology", pp. 76-81 (1982) establishes that electron beams resists are old and well known in the art.

It would have been obvious to one skilled in the art to modify the process of Joy et al., "Advanced SEM Imaging", in Characterization and Metrology for ULSI Technology", 1998 international Conference, (03/1998), AIP conference proceedings 449, pages 653-666 by using photoresists or oxidizable silicon layers as detection means as taught by Elliott, "Integrated Circuit Manufacturing Technology", pp. 76-81 (1982) or Tetsuo et al., JP 11-329944 with a reasonable expectation of capturing/resolving the desired diffraction image based upon the disclosure of the use of these means in the art for detection of electrons.

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The rejection stands for the reasons above without further comment, noting that electron resists are old and well known in the art as useful for electron imaging, so there is a reasonable expectation of success.

5 Claim 3,4,8,14,15,20-22,25,26,30-32,39,41-43,46-47,51-53,56,57,61 and 63-64 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6 **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

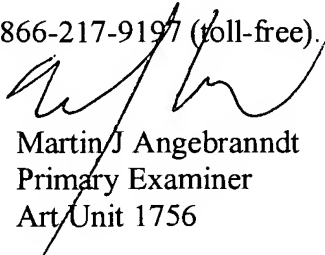
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

7 Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin J Angebrannt whose telephone number is 571-272-1378. The examiner can normally be reached on Monday-Thursday and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 571-272-1385. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Martin J Angebranndt  
Primary Examiner  
Art Unit 1756

4/4/2005